Citrus Industry

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STACKS SCIENCE AND INDUSTRY

Coming Citrus Season Prospects Promising

Another citrus marketing season is "just around the corner," with an abundant crop of quality fruit now maturing on the trees and growers generally in a moderately optimistic mood. As pointed out by Robert W. Rutledge, general manager of Florida Citrus Mutual, in a paper published elsewhere in this issue, all elements contributing to a successful and profitable season seem favorable.

While present indications are that there will be adequate supplies to meet the demand of fresh fruit shippers, concentrators and canners, there is no prospect of an over-supply, and with the various factors competing for the fruit, the coming season should be a sellers', not a buyers', market. With the high cost of production as a handicap in California, and with Texas practically out of the picture, temporarily at least, Florida growers are in position to dominate the market in both the fresh and processing fields.

This is not to indicate that Florida citrus growers are to get rich quick in one season, but the indications all point to a profitable season for the Florida grower of quality fruit—the kind demanded not only by fresh fruit trade, but also by processors.

This Month

Citrus Insect Control For September, 1953
Limes In The Florida Citrus Picture
Prospects For The Coming Season
The History of Florida Citrus
Scraps From My Notebook — Part VI
The Citrus Budwood Certification Program
Hedging Machine For Citrus Groves

Vol. 34, No. 9 Bartow, Florida September, 1953

XUM

3 reasons why

PARATHION
means
BIGGER PROFITS

1

You market more high quality fruit

Experimental research and grower experience have proved that parathion-sprayed groves produce fruit with . . .

higher Vitamin C content
higher solids content
better fruit color
no reduction in sugar content

2

Your groves remain in a more vigorous condition

The healthier your groves, the more boxes of quality fruit per tree. Parathion causes . . .

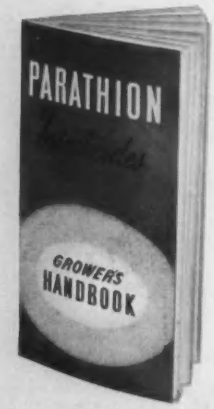
less shock to trees
less leaf drop
less dead wood

Consult your local agricultural authorities for suggestions on dosages and application procedures.

3

You economize in the spray program

Economy in the spray program can best be accomplished by using materials in combination treatments. For example, routine sulfur sprays for rust mite control can be combined with scale control when parathion is used. Because parathion is compatible with many other spray chemicals the number of applications can be reduced and production costs lowered.



Write for New Parathion Grower's Handbook

PARATHION INSECTICIDES ARE
AVAILABLE FROM NATIONAL MANUFACTURERS

AMERICAN Cyanamid COMPANY

Manufacturer of Thiophos® Parathion Technical
Agricultural Chemicals Division
Brewster, Florida

XUM

Citrus Insect Control For September, 1953 . . .

R. M. PRATT AND W. L. THOMPSON*
FLORIDA CITRUS EXPERIMENT STATION, LAKE ALFRED

Purple scale activity has been declining steadily since mid-July and populations are now at normal levels for this time of year. The average infestations will probably level off during September and as a high percentage of the scales is expected to be in the younger stages, good control can be obtained where spraying is necessary.

Red scale populations are not particularly high at this time but activity is increasing, and there is the possibility of a significant increase in September. A very high percent of the scales are in the first two stages, so conditions for control will be favorable in early September.

Purple mite activity is a little higher than average for late August, especially in some of the interior districts. While few groves have heavy enough infestations to justify control measures at this time, care should be taken to avoid a build-up in early fall. Where repeated sulfur sprays have been applied, purple mite infestations may reach a high level in September.

Rust mite activity is still high, especially on the fruit, and these mites may be found in any grove that has not been treated for the past 45 to 60 days. The rate of reinfestation depends largely upon the degree of infestations when the grove was treated and on the the thoroughness of coverage. Where the tops of the trees and inside foliage and fruit were not thoroughly covered with sulfur, the rest of the tree will become infested soon after the sulfur has been washed off by rains. Despite frequent showers, mites can increase rapidly even where the infestations have been kept at a low level all year. It is expected that activity will continue to be high through September.

Spray Program

September is a month when there is not very much activity in the pest control program except for rust mite control, but a few groves may have to be resprayed for scale control. Even though the purple mite index is low, some groves may have to be treated.

This month a general inspection of groves should be made for the major species of scales and mites. In most groves, enough time has passed since the scalicides were applied to determine whether or not satisfactory control was obtained. Examine the spring and summer leaves and twigs as well as fruit, and if numerous living scales are found, the grove should be treated. When examining for living purple scale, turn the armor over and if the insect is a pearly white color, it is living. The living red scale is a pale yellow or orange color. Pay particular attention to the number of living red scales because these can increase very rapidly during September and through November, and if they are numerous, the grove should be sprayed. Close attention should also be paid to the amount of living purple and chaff scale on early varieties of fruit that will have to be degreened before shipping. The area around a living purple or chaff scale will not color but will remain green and such a blemish is a grade lowering factor. If there is a noticeable amount of infested fruit, the grove should be sprayed with parathion several weeks before harvesting.

More gallons of spray per tree are necessary at this time of the year. After three flushes of growth, the trees now have the maximum amount of leaves and the weight of the fruit compacts the foliage, which makes it difficult for the spray to be forced through the canopy of the tree. Mechanical sprayers should be moved slowly and if hand guns are used, the inside of the trees should be sprayed for satisfactory control of scale and mites.

Scale Control: Use parathion at 1 to 1 2/3 pounds, plus 5 pounds of wettable sulfur per 100 gallons. Oil is effective but it will retard degreening of early varieties that are to be picked before mid-November. An oil spray is also likely to effect solids adversely.

Rust Mite Control: On early varieties of oranges and on tangerines, use wettable sulfur 6 to 8 pounds per 100 gallons of spray or dust with sulfur. For midseason and late varieties, 2/3 of a gallon of lime-sulfur per 100 gallons can be added to the wettable sulfur.

Purple mite control may be necessary in some groves. Use one of the Ovotran materials at 1¼ pounds per 100 gallons. Ovotran can be combined with wettable sulfur and parathion.

For more detailed information, refer to the 1953 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

*Written August 25, 1953. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; J. W. Weeks, Avon Park; and T. B. Hallam, Lake Alfred.

ATOMIC ENERGY AS AN AID TO AGRICULTURE

Much wider application of atomic energy in plant science was predicted by Dr. Raymond Blackmore, Batelle Institute, Columbus, Ohio.

Addressing a regional meeting of the Men's Garden Club of America, the research scientist based his prediction on (1) the increasing availability of radioisotopes, (2) steadily improving technology on their use in agricultural research, and (3) the increasing number of personnel trained in the techniques and handling of radioactive materials.

The radioactive tracer technique, when coupled with other analytical procedures, is more sensitive and more specific than any other method of analysis known, Blackmore said. It is the only analytical technique which has the power to observe chemical activities of individual batches of atoms, ions, and molecules within cells, organisms, and other systems.

"We may find radioisotopes being used as a routine research tool in applied problems of agriculture. For example, from the work already done with radiophosphorus in studying the uptake of phosphate fertilizers, it is conceivable that a routine control might be developed for comparing the efficiency of one fertilizer with another, or one batch with another batch of fertilizer. Routine techniques might also be devised for measuring the fixation of nutrient elements in soil, and for evaluating the effect on soil fertility of such factors as acidity, ion exchange, and absorption."

Citrus By-Products Of Florida

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R. HENDRICKSON
FLORIDA CITRUS EXPERIMENT
STATION, LAKE ALFRED

Today the processing of citrus fruit has grown to be a vast and important part of the Florida citrus economy. The industry has grown to such proportions in recent years, particularly since the development of frozen citrus juice concentrate, that more than half the Florida orange and grapefruit crop is now processed.

Since over half the fruit is peel, pulp and seed, a whole new industry was born out of necessity to solve a most difficult waste disposal problem. The manufacture of by-products is an essential part of the citrus industry and is also important to other industries. The rapidly growing Florida cattle industry utilizes large tonnages of two primary by-products, dried citrus pulp and citrus molasses, as stock feeds. The three primary products are dried citrus pulp, molasses and citrus peel oil while citrus seed oil, alcohol, pectin, blend syrup and feed yeast have been produced to a lesser extent.

The production of citrus by-products is now firmly established as an integral part of almost every citrus canning plant, and in some years the proceeds from by-products could spell the difference between profit and loss to the processors.

Other products not manufactured now but worthy of development are the glucosides naringin and hesperidin. The chemical industry has indicated that a potential market exists for large tonnages of these glucosides and that these materials may bring a price which would make them profitable by-products. Workers at the Citrus Experiment Station have been successful in producing dyes by using these two glucosides as intermediates. The particular dyes are acid azo dyes produced by coupling various diazo compounds into naringin and hesperidin. These flavanone glucosides appear to be excellent dye intermediates having considerable possibilities, and the diazos of sulfonic acid, p-nitro-aniline, etc., have been coupled into these glucosides to form yellow-red dyes that are quite bright and pleasing in color. The application of these water soluble dyes is presently limited to wool, silk and leather. However, there has been some recent interest in these dyestuffs as wood stains requiring exceptional light-fast properties.

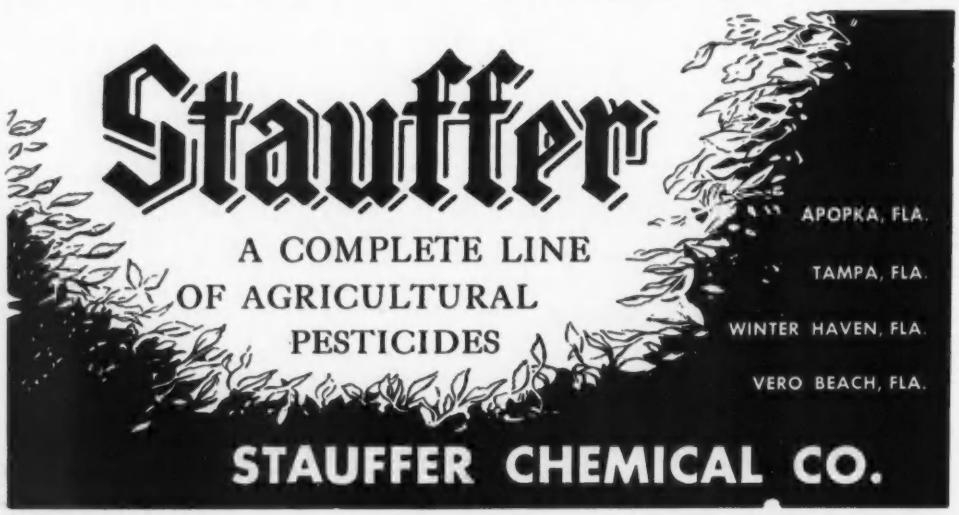
Hesperidin, the glucoside found in oranges, is known to have therapeutic value and has been used to increase the permeability of the capillary membranes as well as to activate Vitamin C. Thus this substance has become to be known as Vitamin P. While it is thought to be a mixture of hesperidin and eriodictin, little is known of its physiological role in animal metabolism.

The bitter taste of grapefruit which is imparted by naringin has been used to advantage in the preparation of beverage drinks. Naringin may also be used to enhance the piquant flavor of high class confections, especially those flavored with citrus flavors. Being harmless, the bitter principle from grapefruit makes a suitable bitter for these purposes. It is sold commercially under the name "Amerin".

There are other possibilities which are worthy of development such as: lactic acid by fermentation of citrus press liquor with lactobacilla; antibiotics and other fermentation products, using citrus waste liquors as the substratum; the preparation of rhamnose from the glucosides by hydrolysis; the preparation of p-coumaric acid and phloroglucin from the alkaline hydrolsis of naringenin which may be used for the synthesis of other organic chemicals; citric acid from either evaporator scale or from precipitated and settled insolubles in the hot sedimentation of citrus press liquor; ascorbic and citric acids in the regenerating effluent of anion exchange resins, methane fermentation of the more dilute waste liquors; and the waxes recovered by polishing winterized peel oils.

All of this leads to the inevitable conclusion that citrus waste residues possess a wealth of raw materials and should be considered a most valuable asset to the citrus processor.

1. Presented before the Twentieth Annual Citrus Growers Institute, Camp McQuarrie—Lake County, Florida—August 19, 1953.



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Limes In The Florida Citrus Picture

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Two names are significant in referring to limes in the Florida Citrus picture. The Mexican or West Indian lime, which is of great importance south of the border, is known as the Key lime—indicating that it flourishes only in tropical climate around the keys. The Tahitian lime, called the Persian lime in Florida, has a long and considerably varied history with some citrus taxonomists tracing its origin back through many centuries to Persian sources. Of these two leading varieties, Persian limes can be grown successfully commercially as far north as central Polk County (although 80% are now grown in Dade County) and are of greater importance in the Florida citrus picture.

The lime industry, which never flourished to any great extent in Florida until after World War I when a renewed interest in acid fruits in the diet sprang up, was stimulated by the purpose of making the state independent of California lemons, since Florida lemons had been practically annihilated in the freeze of 1894-95. A further stimulus was added in the mid 1930's when other citrus, oranges, grapefruit, and tangerines, seemed to be in overproduction and the emphasis shifted to limes.

Until 1933 approximately 10 to 15 thousand trees were planted per year. In 1933, with a phenomenal jump, 47,000 trees were planted and the upward spiral continued so that the 1936-37 season saw 123,054 trees being moved from nurseries to Florida destinations. Halted by the inevitable factor of over-production, the movement of trees from nurseries in the following 3 years dropped at the rate of 40 to 50 thousand per year. Many growers, having felt the financial letdown of over-production, were top-working their lime groves into other varieties. The lime industry remained fairly steady after its peak of 6,000 acres in 1941-42 and gradually fell to a low of 4,500 acres in 1947-48. In 1949 another stimulus appeared—limeade concentrate. The increased popularity of this product brought great enthusiasm into the lime picture and the spiral began to turn upward again. At the present time there are more than 6,000 acres planted to limes with a scramble on for more. Instead of converting lime groves, some growers are now converting their non-profit white-seeded grapefruit to money-making lime trees. No mystery there! Limes brought a season average of $3.00 per box on the tree in the 1951-52 season and although the figure is not yet available for the 1952-53 season it will be close to double last year's price; while white-seeded grapefruit brought only an average $.53 per box on the tree in 1951-52 and approximately $.73 this past season.

With this glowing picture of the growth of the lime industry other growers may be anxious to get on the bandwagon and topwork their white-seeded grapefruit into limes. Among those growers who have already begun this procedure, however, certain problems must be faced.

For instance:

Old grapefruit trees when hatracked for budding and grafting do not respond as quickly and as readily as had been expected.

In the second place it costs about $5.00 per tree to make the conversion and even then because of disease and weather conditions the grower cannot expect to have a high yielding long-lived tree.

Then, too, at this early stage in the concentrate field, there is no guarantee that all this expanded production can be sold in any manner other than through the fresh fruit market.

Now, what can be done about these problems in top-working old groves.

It seems advisable when top-

working old trees of standard spacings with limes, to inter-plant with young trees that are as free of disease as possible. Lime trees are small by nature and will do better on closer spacing than other commercial varieties of citrus.

Another factor to consider is that limes appear to do very well on sweet stocks and sweet trees seem to be more vigorous than grapefruit when top-worked.

Then, to combat the gum or bark disease that is currently attacking trees throughout the lime producing area, it is apparent that one of the best combinations is lime worked on sweet orange that has been budded on lemon-root. In this way the limbs that become girdled by the disease can be removed as they become unproductive, thus maintaining a bearing tree longer than would be possible if there was only one budded trunk.

The cost of production is another factor to be considered in the lime industry.

The Florida Agricultural Experiment Station has, for the past 12 years, through the Dade County Agent's office, been conducting a record study of the cost of producing limes in Dade County. Which, as we have stated, produces some 70 to 80% of the total Florida crop. In their 1950 summary—the latest figures available from this study—27% of all the Persian lime acreage in Dade County was included.

Figures taken from this study show an average cost of $386.14 per acre for purchasing land, developing, and planting trees. The growing cost for an acre of limes between 1 and 3 years of age per year averaged $159.76.

Since these figures were compiled, I am informed, the average cost of raw land has increased from $81.18 per acre to approximately $200, and the growing cost has increased some 15 to 30%.

The average growing cost in the 4 to 7 year old groves from 1939 to 1949 was $270.81 per acre, or $2.94 per bushel. During this same ten year period, groves 8 years and older had a cost average of $271.65 per acre or $1.39 per bushel.

The 4 to 7 year age group averaged a yield of 92 bushels per acre during the ten year period; while those groves 8 years and over yielded 194.9 bushels per acre.

Returns on the later, or older groves, ranged from a net loss of 57 cents per bushel in 1946 when the hurricane took its toll of fruit and trees, to a net profit of $1.78 per bushel in 1943, a year of fair yields and good prices. The average net return per acre for the ten year period was $107.47.

Cultural practices have changed considerably during the last three years, however, 4-7-5 and 4-8-8 still remain the standard fertilizer formulas for most lime growers but the applications have increased from 4 times per year, as was customary, to the extent that many growers are now fertilizing every 60 days and irrigating every 7 to 14 days.

Typical of this new routine is the 1952-53 program for a 9 acre grove belonging to one of the more successful growers: He uses 96 bags every 60 days or better than 1000 pounds of a 4-8-8 fertilizer per acre 6 times per year plus irrigation every 7 to 10 days. In 1952 this grove was picked every month and produced 5800 bushels of fruit which averaged $1.80 per bushel on the tree. The grove is better than average but yellow tipping is evident and the trees seem none too vigorous at this time.

Most growers do their own picking which ranges from $1.50 per 55 pound box in the early season, down to 45 cents per box during the peak of production.

Disease, another factor which has always been a problem in the lime industry, has shown an increase in recent years, especially in the Dade County area. Only 3 or 4 years ago the Idemore lime was considered an excellent virus free variety, yet today a profitable grove of Idemore limes is rare if at all. A block of Idemores visited in 1952 appeared thrifty, with only one or two trees showing evidence of disease; this same block visited 12 months later showed 52 of the 186 trees (approximately 8 years of age) had been removed and about 50 more were obviously stricken.

Unfortunately the trouble is not limited to the Idemore variety. All varieties under most management appear to be diseased to some extent.

The following slides show what this disease problem is costing the industry—a problem that is all too general:

There is at present a great interest in the frozen lime juice business, and many growers are wondering if they should plant lime trees. This report should not be considered as sounding a pessimistic note but rather as showing both sides of the picture of the lime industry in Florida; its history of expansion on the one hand and its current problems on the other.

Your speaker concurs with Mr. Marvin H. Walker, General Manager of the Florida Citrus Canners Cooperative, who recently stated, "I think there is a wonderful future for the frozen lime juice business if its development is handled properly, but the man who invests in new plantings should understand that while the profit opportunities appear good, the marketing hazards also can be great."

So in conclusion, expansion in the lime industry seems logical at present but it should be comparatively slow expansion, with the grower keeping in contact with research developments in producing, processing and marketing.

NORRIS SAYS CITRUS TREES, COVER CROPS ARE IN GOOD SHAPE

Citrus trees are in good condition and grove cover crops have made excellent growth in Lake County during the past month, according to County Agent R. E. Norris.

Soil moisture has been generally adequate in most parts of the county since the beginning of the "rainy season" and lake levels have risen very noticeably. Rainfall in July was so heavy in some sections that fertilizer was leached from groves and pastures, making additional applications necessary.

Rust mites have been more troublesome this summer than in several years, and scale control has been difficult in groves where rains fell almost daily, Mr. Norris says.

CONCENTRATE ORANGE JUICE FOR SCHOOL LUNCHES

The U. S. Department of Agriculture has announced that offers have been accepted for 92,587 cases, 12 No. 3 cylinder cans per case, of concentrated orange juice at prices ranging from $9.90 to $9.96 per case. Purchases were made under Section 6 of the National School Lunch Act of 1946.

This concentrate, which is the 3 plus 1 ratio (three parts water plus one of concentrate), will be delivered during the period August 17 through September 19, 1953, to schools participating in the National School Lunch Program.

Purchases were made from processors in California under Announcement FV-203 dated July 13. These acceptances complete the purchases to be made under this announcement.

XUM

Prospects For The Coming Season

Address Given By
ROBERT W. RUTLEDGE,
General Manager
Florida Citrus Mutual

Annual Citrus Growers Institute,
Camp McQuarrie, August 19, 1953

Mutual was organized and functions today to do one big job:

Create the most favorable conditions possible for its grower members to market their fruit and give them the information they need in order to dispose of their fruit at prices justified by the factors making up supply and demand.

This may well be the pattern of Mutual for years to come. It was a successful pattern last season and, since the only valid way to measure the future of anything, person or organization, is the record of past performance, Mutual's future should be good.

AND, since most of the growers in Florida are members of Mutual—AND, since all segments of the industry receive benefits from its operations—the PROSPECTS FOR THE COMING SEASON ARE GOOD.

However, to really appreciate the value of these prospects which I shall detail later, it is necessary to investigate the past, examine Mutual's role in the industry and the part it played in the successful movements of this past season's crop.

It doesn't take much effort to recall the conditions which existed in those dark years prior to Mutual. As a matter of fact, most of us would rather forget about them and the grim thought of this industry continuing under those conditions.

Keeping that in mind, it is not hard to imagine what Mutual has done for the grower aside from its widely recognized leadership role in bringing unity to the industry.

It has given him a voice—a powerful united voice—that now speaks WITH AUTHORITY FOR RESULTS. It has given him the power that comes with enlightenment—enlightenment in the form of information, information that enables him to deal intelligently with those who would purchase his crops—and those who would attempt to beat him on his crops. It has given him the mechanism to set up and develop new outlets—outlets which have created more demand to balance the supply side of the picture. It has given him the leadership to execute his wishes—leadership that is backed by a solid front of cooperation and loyalty.

There are, of course, many other things Mutual has accomplished for the grower and the industry. However, they are much too detailed to mention here.

It has been said that one thing alone in this world has a universal voice—one thing that is understood everywhere—and that one thing is money. Probably more appreciated than anything else is the fact that Mutual has played a big part in grower returns.

The question already formed in your minds is "how much?" That answer is relative, immeasurable and tied to many variables. For instance, many studied and informed persons in the industry—many, many of our growers—have told us that during the past season, Mutual was worth 25 to 50 cents a box to the average orange grower.

Just how much additional money Mutual brought its grower members is a matter of opinion. But several times during the past season, when the going was rough and when conditions looked perfect for prices to take a headlong plunge, Mutual stepped into the breach with its loud, powerful and correct information and you know the results. Immeasurable in dollars, to be sure, but profound in results.

In other aspects of Mutual's past, which is the barometer of its future and your future, comes the realization of the profound effect it had at other times during the citrus year now ending.

All of you remember the long interim period when the midseason crop was gone and Valencias weren't yet sweet enough for concentrators to use. A trying time to be sure. But you know the result of that tempest as Mutual continued its accurate information which equipped the grower with the tenacity to hold for prices dictated by economic factors of supply and demand for a commodity scarce in supply.

To detail Mutual's activities in a single one-year capsule is nearly impossible. Yet that capsule needs opening. It needs to be swallowed and its contents digested to fully appreciate the vital role Mutual had in marketing last year's crop.

Consider for a moment Mutual's successful program of adjusting shipments to demand—Mutual's history-making, precedent-breaking information on the value of early and mid-season oranges—Mutual's distribution of figures giving all intermediate costs from tree to retail level on fresh, canned and frozen concentrate oranges with simflar information on grapefruit—Mutual's constant awareness to and action on the problem of supply and demand—Mutual's complete and true representation of the grower at every industry conference—Mutual's widespread work by its northern market representatives—Mutual's dynamic Market Information services which have made the Florida grower the best informed grower in the world—Mutual's constant effort to enlarge markets—to increase the demand for this ever increasing crop—Mutual's one million dollar dispenser program—Mutual's recently created Export Department to find even more outlets for Florida fruit—Mutual's efforts to find markets for and reasonable returns on grapefruit.

JUST A FEW ITEMS IN THAT GIANT SIZE CAPSULE BUT IMPORTANT ONES!

It takes a lot of courage sometimes to come out with this kind of information. But it is information our growers need to sell their crops intelligently. We have given it to them in the past and we intend to continue it in the future.

It was an important year for Mutual—this year just past—and an even more important year for Mutual's members and the industry. Following in its wake has come the realization of Mutual's pace setting activities and giant size role it occupies in the citrus future.

With some of these considerations in mind, then, it is not hard to predict or take a look at the future. Fortified with a promise of future activity on the basis of past results and an analysis of all the factors which affect the citrus future, I would like to emphasize that prospects for the coming season are good. IT SHOULD BE SAID OVER AND OVER AGAIN—PROSPECTS FOR THE COMING SEASON ARE GOOD—PROSPECTS FOR THE COMING SEASON ARE GOOD!

Under present conditions, there are two important things which could dim those prospects. The first, as I have said before, is that we DO NOT FIGHT AMONG OURSELVES. It is almost mandatory, with the

complexities of the industry, that COOPERATION must prevail among growers, shippers, processors and our Northern friends. With the proper spirit of COOPERATION we can and will do the job.

Second is a possible significant recession in our national income. Always influenced by this type of change, citrus prospects would be dimmed by a recession already predicted in some quarters.

But based on conditions as they are now and as they look to continue, the situation should be good.

AND HERE ARE SOME OF THE REASONS WHY:

At the onset, I would be derelict in my duty to the growers of Mutual if I did not say that one of the biggest reasons is Mutual itself. I have already told you of its dynamic past and I can assure you its future will be equally dynamic to the growers of Florida.

We have no crystal ball at Mutual. We claim no clairvoyant powers. We cannot predict hurricanes, freezes or other Providential events. But we can and do interpret the analyses of our economists and other industry factors.

Included among these favorable factors is a growing demand for our product. The Florida citrus grower is one of the few producers of a product in the country today where demand is outdoing supply.

One of our principal aims in Mutual will be to see that that pattern continues. We can and will move the crop profitably AND THIS IS FAVORABLE.

Having a most important bearing on these prospects is the inventory position going into this new season. Figures available for analysis today reveal that processed and concentrate stocks are low, AND THIS IS FAVORABLE.

Concentrators this last season could not get all the oranges they wanted, and, as a result, their total output was substantially less than what they could have used to supply a phenomenally increasing public demand.

Canned citrus products are much in the same position and there will be no depressing over-supplies hanging around when the new crop starts moving to market, AND THIS IS FAVORABLE.

This is a most encouraging situation as it means competition will exist almost from the very beginning of the season as concentrators and canners find their warehouse stocks at almost dangerously low levels. Concentrators, in fact, are being forced to raise their prices to keep the public from using the product in such volume that they might run out before another season starts.

This means a sort of "rationing by price" so as to stretch available supplies until oranges from the new crop are available and more concentrate can be made.

Also having a close bearing on the prospects will be the size of the crop. The first official United States Department of Agriculture estimate of the new crop will not be made until October 10, but at Mutual we keep a very close check on reports of condition of the new crop and supplement this with information on reports from our own force of field men who are constantly moving about and talking with growers in all parts of the citrus belt.

As of today, all of these signs point to a moderate increase in the orange crop as compared with last season. We could have used more oranges last season than we had and Mutual told its members just that even when Uncle Sam came out in October last year with an estimate of 81,000,000 boxes. This was finally whittled down to 72,800,000 boxes before the season ended. And the industry is in a much better position from an inventory standpoint now than it was a year ago and again, THIS IS FAVORABLE.

Signs also point to a slightly larger grapefruit crop. And Mutual is taking immediate steps to help grapefruit growers market their crops profitably. Our industry Grapefruit Supply and Demand Committee will delve into all factors affecting grapefruit and all problems arising from increased production. In addition, our Export Department will seek to expand the European grapefruit markets.

Rounding out these FAVORABLE PROSPECTS are the situations in the other citrus producing areas—California and Texas. Reports from California indicate that the high cost of production is rapidly causing growers to tear up their groves and turn them to other purposes. California is still in the picture but signs point more and more to the day when Florida will have little competition—even from this area.

Texas, almost completely out of the picture due to a devastating freeze, has not made a comeback. Growers there are also being bothered by irrigating problems with a reliable report that water is not available and what they can obtain is too salty for citrus. THESE ARE ALSO FAVORABLE!

There are some reports of competition developing from other countries but it will not be large enough to dim the picture. Helping to combat this will be Mutual's new export program. Early reports indicate a vast export market for Florida fruit —especially grapefruit and THIS IS ALSO FAVORABLE.

So with a picture composed of so many bright shades—with all considerations given careful thought and sound study—and with the industry and imagination of the rugged individualist that is the Florida citrus grower, THE PROSPECTS ARE GOOD.

We at Mutual are prepared to give the same kind of service to our members again this coming season. We believe it to be a sound, sane and logical approach to the price problem. It is based on the belief that the average Florida citrus grower knows when to market his crop—if he has the facts!

Acting collectively through Mutual, our members get these facts.

It demonstrates again the truthfulness of the slogan which identifies Mutual that: COOPERATION IS PROFIT!

MARKET ORDER FOR CALIF.-ARIZ. NAVEL ORANGES APPROVED

The U. S. Department of Agriculture announced its approval, subject to industry acceptance, of a proposed marketing agreement and order regulating the handling of Navel oranges grown in California and Arizona. The decision is based upon evidence received at a public hearing held on April 27 through May 4 at Los Angeles.

The proposed marketing agreement and order would authorize the issuance of volume regulations limiting the shipment of Navel oranges and the allocation of shipments among handlers on the basis of their tree crop. The program also authorizes the issuance of size regulations.

The proposed marketing agreement is being submitted to the handlers of Navel oranges for their signature. Producers of Navel oranges in the production area will vote in a referendum to determine whether they favor the issuance of an order identical to the marketing agreement. The time and manner of voting will be announced shortly by M. T. Coogan, field representative, Fruit and Vegetable Branch, Production and Marketing Administration, Room 1005, 1031 South Broadway, Los Angeles.

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The Citrus Budwood Certification Program

ED L. AYERS
PLANT COMMISSIONER
STATE PLANT BOARD
at Citrus Growers Institute,
Camp McQuarrie

For a number of years Florida growers, though producing more than half of the United States' citrus fruit crop, have been carrying a staggering handicap of unproductive submarginal trees. In most instances, chronic unproductiveness has been caused by one or more of the infectious bud-transmitted diseases that attack citrus. Actual control of bud-propagated or bud-transmitted diseases of citrus, such as psorosis in its several forms, xyloporosis, and exocortis, can be achieved with close cooperation between growers, nurserymen, and regulatory and research agencies. In 1937, California started a cooperative program to control psorosis through budwood certification, and in 1948 Texas followed with a similar but improved program for the same purpose. In October of 1952, Florida's State Plant Board adopted a further improved cooperative program known as the Florida Citrus Budwood Certification Program.

The Florida program was sponsored and developed by the citrus growers of the State through such organizations as the Florida State Horticultural Society and the Florida Citrus Production Managers Association in consultation with specialists of the United States Department of Agriculture, the Florida Agricultural Experiment Station, the Agricultural Extension Service, and the State Plant Board. A standing committee was appointed representing all of these organizations. After several meetings and a discussion of all phases of the problem, the Florida program was presented to the State Plant Board and adopted. This program goes further than those of Texas and California in providing sources of budwood and nursey stock free, not only from such bud-transmitted diseases as psorosis in its several forms, but also xyloporosis and exocortis.

At the time the Citrus Budwood Certification Program was adopted, the State Plant Board had no money at hand for putting it into effect. And here again the citrus growers, not willing to wait a year until appropriations could be obtained for the purpose, went to the State Cabinet with the help of the Florida Citrus Commission and obtained an allotment from the State's Emergency Fund of $12,000. Organization of the program actually got under way around the first of December 1952. This put the operation of the program practically a full year ahead of what would have been possible had it been necessary to wait for an appropriation from the 1953 meeting of the Legislature.

Realizing that Gainesville would not make a suitable place for headquarters for this work, due to the fact that it is not centrally located in the citrus belt, the State Plant Board obtained from the Commissioner of Agriculture, Honorable Nathan Mayo, an office in the Mayo Building at Winter Haven, Florida and placed Mr. Gerald G. Norman in charge. A small nursery plot was purchased nearby, and nurserymen of the State were notified. Soon after the program became established enough trees were signed up to tax the capacity of the organization to such an extent that additional inspectors were loaned from other departments for the inspection of the important spring flush of growth.

Briefly, the Citrus Budwood Certification Program provides: Nurserymen and growers in Florida who desire to participate in the Citrus Budwood Certification Program may make application to the Plant Board, on forms provided for that purpose, for the examination of not more than forty trees of all varieties.

The trees are to be at least 10 years old, preferably older, from date of planting on the property, vigorous, and productive.

Inspectors examine the trees selected by the nurseryman and grower, as well as the four trees immediately surrounding each tree, provided they are growing within 35 feet of the prospective parent tree, at a time when flushes of growth are present on the tree, and determine to their satisfaction that:

(1) The prospective parent tree is apparently free from Florida gummosis, exocortis, blight, leprosis, and evidence of bud mutation;
(2) The prospective parent tree, together with the four trees immediately surrounding it, is apparently free from bark and leaf symptoms of psorosis in any of its types, or other recognizable bud-transmissible disease.

If the prospective parent tree, as well as the four trees immediately surrounding each tree, passes the preliminary inspection, it then becomes eligible for subsequent registration, provided:

(1) Reinspections of all the trees involved during flushes of growth over a period lasting through two subsequent spring growth periods fail to disclose any evidence of the presence of any of the diseases specified.
(2) Test Plot Inspections: Inspections made of buds removed from prospective parent trees and propagated in a registration test plot provided and maintained by the State Plant Board fail to disclose any evidence of symptoms of specified diseases.

Buds are removed from individual prospective parent trees and inserted in rootstocks which have not been previously budded, as follows:

2 buds in 3 sweet orange seedlings
2 buds in 3 Orlando tangelo seedlings.

The buds are inspected for a period which includes two subsequent spring growths and at a time when the growth is most favorable for the detection of symptoms of psorosis. Those budded into Orlando tangelo seedlings are to be inspected for 4 years for symptoms of xyloporsis.

Trees properly passing inspections and tests are registered as parent trees valid for a five-year period unless revoked for cause.

In order to provide an adequate source of budwood believed to be free from bud-transmissible diseases at the earliest possible date, the nurseryman can, at his own risk, propagate prospective scion grove trees at any time after the prospec-

(Continued on page 18)

Scraps From My Notebook . . .

. . . By . . .

Gray Singleton

Food Technologist, J. William Horsey Corporation

WASTE WATER DISPOSAL

Part VI.

No matter how large or how small the food plant may be it is sure to have the problem of waste disposal. It has not been many years since both fresh fruit packing houses and canning plants hauled their culls and waste out into the woods and dumped them. Some of these waste piles were four feet deep and covered as much as forty acres of land. Flies bred in these waste piles by the millions and the odor of rotting fruit reached for miles.

State, County and City health authorities became alarmed and brought pressure on the processors to abate this health hazard. One of the results of this drive was the development of citrus pulp into cattle feed. For several years this dried pulp sold at prices ranging from $16.00 to $18.00 per ton and there was little or no profit in it, but it was the cheapest way to dispose of the enormous tonnage of waste and the processors regarded any loss as a disposal charge. The production of feed from waste citrus continued, even when the cost was greater than the return. The dairymen and ranchers soon realized the feeding value of dried cirtus pulp and the loss was changed to a substantial profit.

However, the problem of waste water disposal continued and today it remains the number one headache of the processors, both large and small. For a time the waste water was pumped to the nearest lake or stream and the problem was considered solved. But it refused to stay solved. The high BOD (biochemical oxygen demand) of the fermenting waste killed fish and the juice sacs and other insoluble solids in the waste, accumulated along the shores of streams and lakes, causing the same foul odors and fly breeding grounds that had stopped the dumping of peel and culls in the woods. Bathing beaches on the lakes became slimy with rotting pulp and something had to be done.

About this time some bright mind conceived the idea of pumping this waste water into the ground. It was found that, if a well were drilled to the Ocala limestone, practically any amount of water could be pumped into this well and would disappear. Two facts were overlooked or disregarded. The first was that such waste continues to ferment, even though pumped a thousand feet into the ground. The second important fact was that the Ocala limestone is the source of most of the municipal water supply in South Florida.

When this waste water fermented under anaerobic conditions an enormous amount of methane gas was formed. Soon the city pumps were getting gas instead of water and when they did get water it was contaminated with rotting juice sacs and bits of peel. The cities did not like this and said so—to the State Board of Health.

The next step was to pump the waste water to some convenient swamp that was as far removed from human habitation as possible. This is very expensive and is building up a situation that is likely to cause trouble in the future. It is not the permanent answer to the problem.

There is, however, a means of disposing of this waste water which may prove even more profitable than the dried pulp. This solution lies in the fertilizing value of the waste water.

Like stable manure, the growth-promoting value of this waste water is far in excess of anything that we can account for by analysis. There is little nitrogen, phosphoric acid or potash in this waste water but, as a plant growth stimulant, it is far ahead of any commercial fertilizer.

So far as I know, this effect was first noted at the plant of the Lakeland Highlands Canning Co, at Highlands City, south of Lakeland. The plant is located on a sandy hill and we got the idea that we might soak our waste water into the sand where it would be filtered and effectively disposed of.

We tried it and it worked better than we had hoped. We laid out three waste disposal areas and pumped the water to one area for two days. We then switched the water to another area and let the first area dry for two days, then ran a disc over it and it was ready for another soaking.

At first the water was all released at the highest point in the area and allowed to run by gravity until it soaked into the ground. This started gullies and the water absorption was not to good. We then tried distributing the water with irrigating pipe. This worked perfectly.

By careful tests we found that we could dispose of about 600 gallons of water per minute into each acre of freshly disced ground during each two-day period. The soil was Lakeland fine sand with a slope averaging about six inches per hundred feet.

In this water was included the waste from all departments of the plant, including the spent alkali from the peeling room. This spent alkali can cause trouble if there are stump holes or gopher holes in the disposal area, where the water can get down to the red, sandy clay underlying the sandy topsoil. This red clay dissolves like sugar when even very dilute alkali comes in contact with it. We had a stump hole on the edge of one of the disposal areas. The water got into it and, before we knew what was going on, the stump hole was more than one hundred feet deep and fifty feet wide. We had several stump holes and gopher holes get started this way. If caught when they first start it is easy to fill them with sand and have no further trouble.

We had not been using this disposal system very long before it was noticed that the grass and weeds on the areas were growing at a rate never before seen on sandy land. It is doubtful that even the best muck in the Everglades produces such rapid growth. In order to see if this rate of growth would hold true for vegetables we put an experimental garden in one of the areas. In this garden we planted mustard, turnips, spinach, broccoli, snap beans, lima

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beans, speckled butter beans, blackeyed peas, tomatoes, okra and squash.

We quickly found that the waste water would kill weeds and vegetables that it touched but not grass or trees. We made our first plantings on flat rows. The water flowed over the young plants and killed them. We then planted on ridged rows elevated about six inches and had no more trouble. The water flowed between the rows and caused no damage.

The leafy vegetables, tomatoes, okra and squash made unbelievable growth and yields. In a short time the okra was ten feet high. In a few weeks the turnips were three feet high and so tender that the stems cracked when handled. Spinach and broccoli were the finest that I have ever seen. Mustard leaves looked like caladiums. The flavor of all these vegetables was excellent. For consumer acceptance tests we put them in the stores in Lakeland. They all wanted more. We kept the test going for six weeks with no complaints.

With the legumes it was a different story. The plants made enormous growth and bloomed profusely but set no fruit. Practically all the bloom dropped off. We did not set a single lima bean or butter bean. A few snap beans and blackeyed peas were set. We used a bush type of blackeyed pea but they refused to be bushes. The vines were three feet deep on the ground and this was on thin, sandy soil with no added fertilizer.

An adjoining land owner, who had cattle, saw how the grass grew on our disposal area. He had a corner of his field infested with bermuda grass and he asked us to run some of the waste water onto his grass. We were reluctant to do this, fearing that the cattle might drink the water and be killed. He insisted and agreed to take the risk, so we tried it. He fenced off one acre and we put the water on it. Nitrate of soda has never made grass grow as this did. Soon there were six cows on the acre and they could not keep the grass down.

The first thing that the cows did was to drink the water. They seemed to like it. We expected them to die but they thrived on it. They have been eating this grass and drinking the water for ten years with no damage than we can detect.

As the years passed we made studies of the soil to see what changes were taking place. Much to our surprise there was no change that we could measure except in the first few inches. After using one area for nine years the pH of the soil was unchanged below 12 inches, with very litle change even in the top soil. Considerable organic matter accumulated in the top six inches but there was no change below 10 inches.

In planning the location of any food processing plants, especially plants for citrus and sea food, it is well to keep in mind the problem of waste water disposal and locate the plant adjacent to a sandy area or pasture where waste water can be a great asset instead of a liability. A plant interested in canning or freezing vegetables could make enormous crops by use of their waste water.

SUMTER MARKET SALES

More than 400,000 packages of vegetables were sold on the two auction markets in Sumter County during the season that ended recently, according to County Agent O. M. Maines, Jr. The total value of the produce was nearly $1,500,000.

Spuds Johnson says the successful man makes the most profits from the fewest mistakes.

Since prehistoric times men have buried things of value for safekeeping. Modern bank protection makes burying actual cash rather foolhardy but when you "bury" your money in the form of fertilizers and d/p DOLOMITE, you're planting riches that will bring future cash dividends.

d/p DOLOMITE conditions soils by restoring alkaline balance to produce better crops, better pastures—both of which are vital to the future health and wealth of our nation.

So *bury your money* in the form of d/p DOLOMITE with the happy knowledge that you've planted future riches in the soil.

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Hedging Machine For Citrus Groves

DAVID S. PROSSER, JR.

Introduction

In the past few years considerable interest has been aroused in a mechanical method of hedging citrus groves. This has been brought about by the high cost of hedging and pruning by hand; by the increasing acreage of citrus groves in which the trees have grown together to form canopies; and by the education of the grower to a complete program of fertilization, insect and disease control calling for the use of large grove equipment and necessitating space between trees for this equipment to operate satisfactorily.

Hedging consists of cutting back the trees vertically on both sides of the grove middles to a predetermined line to provide an aisle of passageway six to eight feet wide for sunlight to enter and for trucks and grove equipment to maneuver without damage to either trees or equipment.

A machine has been developed at the Citrus Experiment Station that will do a good job of hedging at a low cost. It consists of a column of 12" circular saws on mandrels mounted in a vertical line and overlapped slightly to provide a complete vertical cutting line that can be easily and efficiently moved down grove middles for hedging purposes.

Specification for the Hedging Machine

This machine is mounted on a flat bed truck so that it may be quickly transported from one experimental site to another. A better arrangement for local use is a trailer mounting pulled by a tractor. Most machines under construction at present are of this later type.

Saw and Supports.—The 12-gauge steel saws shown are slightly heavier than standard woodworking saws. Most manufacturers do not charge extra for supplying a heavier gauge steel and the additional safety factor obtained warrants its use. A type "N" tooth construction has been found to do the best cutting job on a 12" diameter blade. The 1 3/16" saw shafts are supported by 1 3/16" standard pillow block ball bearings attached to a bar of 6" channel iron which forms the vertical support. The channel iron is welded at the bottom to a 2 7/16" shaft which carries the entire weight of the upright column. This shaft runs across the truck body and is mounted in heavy babbit bearings which allow it to swing in an arc. This enables the saw column to be lowered and locked for travel or storage. When the machine is in the grove and ready for hedging a lock-down device on the rear is loosened and the bar is raised by means of a hand-operated hydraulic jack attached to the truck frame. When the bar reaches its operating position, two braces are bolted to it to increase strength and rigidity. Brace "A" is normally pivoted so that it is carried inside the main bar in the down position and attached to the rear support in the up position. Brace "B" is carried in a rack on the side of the truck and is bolted top and bottom when the bar is in operating position.

Power Requirements and Drive.—The drive consists of a medium-sized gasoline engine, driving through two "C" vee belts, to sheaves on the saw shafts. These sheaves are of variable pitch construction so that the belt may be tightened by simply screwing down one side of the sheave. The power requirements can be roughly figured to be 1½ horsepower for each saw shaft by "B" vee belts running in variable pitch sheaves. The most satisfactory vee belt has been found to be the cog type belt with internal wire rope. These do not stretch as much and will transmit more horsepower per belt than the ordinary type. Best results are obtained with the saws running at approximately 3,000 rpm.

Construction Details.—All saws in the above arrangement will have the same direction of rotation, which in experiments has been found to give the cleanest cut. If saws are rotated in opposite directions they tend to snap the branches through instead of cutting them. Saws should be overlapped about ¼ of an inch and the whole line of saws should be set on a slight angle of approximately 8° with the truck body. This allows the trailing edge of the blades to clear the cut branches and helps decrease ragging. All engine controls and the clutch throw out are located on the side of the truck body away from the saws so that men operating the equipment are not standing in the path of flying branches and debris.

Field Operation

In grove operations the saw column is raised and secured, the driving engine started and the clutch engaged. After the saws have reached their rated speed the truck is slowly moved forward until the driver is headed in a straight line down the middle, with the truck in position to give the correct width of cut. The driver then puts the truck in double low gear and lets it move slowly down the middle, meanwhile watching the hedging to make sure no saws become jammed from branches wedging into them. If saws become jammed the driver stops the truck immediately to prevent tearing off the caught branches. As far as can be ascertained, there is no damage to the machine from jamming, beyond the momentary slipping of the belts. The driver may back up slowly and release the branches, or sometimes it is necessary to walk around the truck and pull the branches out by hand with the machine stopped.

In the usual operation a second man walks beside the truck on the driver's side and works the engine controls. This man also takes the branches as they are cut and throws them to one side or under the trees. Both the driver and the man throwing brush should wear goggles as protection against flying sawdust. The maximum speed the machine may be run to obtain good results

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is about one mile per hour, which corresponds to an approximate rate of an acre per hour. In general the faster the machine moves the more ragged will be the cutting. If only small branches less than one inch in diameter are to be hedged, speed is relatively immaterial, due to the fact that most small branches sustain some ragging because of their lack of resistance to the saw blades. This ragging has not proved to be harmful in the past; the small branches and twigs recover rapidly and put out a vigorous growth where hedging is done at the proper time.

The best time to hedge appears to be immediately before the spring flush of growth. Then the new growth comes out rapidly and the dead wood and loss of protection are held to a minimum. Best results are obtained by hedging the east and west sides of the tree, since there is less sunlight present on the north side during the winter months. Growth of new wood is more rapid and loss of bearing surface due to dying back is less where sufficient sunlight may hit the hedged branches. If it is necessary to hedge the north side of the tree it is advisable not to cut back severely.

If it is desirable that the hedging job be finished by hand to improve the appearance and to remove any branches missed by the machine, a small truck with a series of wooden steps mounted on the rear may be used to good advantage. A man with hand shears can move up and down these steps as the truck progresses down the middle and cut out the branches at the necessary heights.

COST

Saws must be sharpened after approximately 100 hours use, which usually costs about 90 cents per saw when the work is done on a local sharpening machine. Belts and bearings may reasonably be expected to last 1,000 to 2,000 hours and an engine overhaul would be necessary on occasion. Due to the heavy amount of sawdust in the air, the engine air cleaner should be serviced daily. The initial cost of the machine may be roughly computed as follows, based on current prices.

Saws	$11.00 each
Bearings	5.00 each
Belts	2.50 each
Sheaves	4.25 each
Driving engine	$700 to $1,000
Steel framing and shafting	$50
Labor and installation	$200 to $250

Total cost for a 12-saw unit should be in the neighborhood of $1,500 without trailer or truck bed.

Some of the more recent machines under construction use two individual units of 12 saws each mounted on channel arms, one on either side of the truck and attached to the supporting shaft in such a fashion that they may be slid back and forth on this shaft to vary the width of the cut. Naturally the cost of a machine of this type will be nearly double that of the single machine.

Field Performance

The hedging machine will cut out a grove approximately 10 times as fast as an equal number of men using hand shears. If it is desired to hand finish the job the ultimate time by machine will still be less than half that necessary for hand hedging.

Preliminary experiments with the hedging machine have indicated loss of production the first year after hedging as compared with a check block, but an increased production over the check in the second year. Also, there is a decrease of dead wood in hedged blocks the second year due to increased sunlight and effectiveness of the spray and dust program. Results on two 25-year-old commercial grapefruit groves over a two-year period showed a loss of one-half box of fruit the first year compared with unhedged trees, and an increase of one-fourth box per tree over unhedged trees the second year. Average production for the two years was approximately 14 boxes per tree in the checks.

Other advantages to hedging not previously mentioned include the decreased cost of picking the fruit and decreased damage to trees and trucks where using goats[1] for hauling or bulk fruit operations in the grove.

Summary

A mechanical hedging machine has been developed for use in citrus groves in Florida. Construction specifications and operational data have been presented. Use of this machine affords an economical method of hedging citrus groves with the attendant advantages of increased production, ease of movement through grove, decrease in dead wood, and increased effectiveness of spray and dust programs.

1. The term "goat" designates a stripped-down truck without cab, and with narrow body floor for hauling fruit out of groves.

Manure produced by a dairy cow each year contains around $30 worth of plant food elements.

Beef provides good quality protein, important for body building and repair.

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Florida growers know the reasons why magnesium is needed so ask your fertilizer manufacturer for EMJEO, long a dependable source of this key plant food.

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The History Of Florida Citrus

LOUIS W. ZEIGLER
ASSOCIATE PROFESSOR,
HORTICULTURE
UNIVERSITY OF FLORIDA

(Presented at the 20th Annual Citrus Growers Institute, Camp McQuarrie, August 20, 1953.)

The association of Florida and citrus is inseparable. Were I to stay strictly within the limits of the topic assigned, the case of Florida and citrus could be begun with the first explorations and settlements by the Spaniards in the 16th century. From that early beginning the history of Florida and citrus could be presented in all of their disasters and triumph, filling many pages of notes. Yet, such a history, fragmentary though it be at times, might be gathered much more interestingly from the pages of many volumes of papers written by highly capable authors.

In order to justify, at least in part, the topic assigned, one might set forth a number of factors which have made for the inseparable association referred to above.

1. The early explorers and settlers brought citrus with them. Limes, lemons, sour oranges and perhaps sweet oranges were thus introduced to the territory which is now the State of Florida.

2. The plants of the citrus group proved adaptable to the climatic and soil conditions to such an extent that in many locations they grew as though native to the land.

3. In the early 1800's Don Phillippe settled in what is now Pinellas County. He introduced the culture of grapefruit, having obtained the fruit from the West Indian Islands. The forerunner of all of the commercial varieties known today, this introduction paved the way for the development of the grapefruit industry.

4. The acquisition of Florida by the United States in 1821 removed certain of the barriers separating the territory from other portions of the United States. In 1845 Florida was admitted to the Union which brought this tie to the balance of the United States much closer.

5. During the 1850's pioneers envisioned the possibilities of the citrus fruits in commercial production and began the plantings of the early groves along the St. Johns River and other waterways.

6. During the 1860's many short railroads began to be developed. Their connections and final absorption into the three large systems known today brought many hitherto inaccessible areas within the reach of the centers of population. Prior to the establishment of the railroads, dependence was placed on water transportation which very definitely limited distribution and was unsatisfactory from the standpoint of time in transit.

7. During the fruitful decade of the 1870's the growers began the use of budding as a standard practice. Recognizing the superiority of certain types of fruits, the practice of growing named varieties began to appear. Further, through importations, far-sighted growers brought into culture varieties which appeared to hold special promise.

8. About the turn of the century the use of Rough Lemon as a rootstock was begun. Adapted, as it is, to the high sandhills of the state, there was no longer the necessity to restrict plantings to land along the waterways and around the lakes.

9. The discovery of Citrus Canker in 1912 in Florida and its subsequent eradication led to the realization by the growers that the citrus industry must be protected from the myriad insects, mites and diseases which find the citrus group of plants ideal for their purposes.

10. The Florida Land Boom in the early 1920's brought new capital into the state and established many of the largest developments of citrus properties.

11. World War II, demanding as it did the diversion of the citrus crop to uses allied with defense, reflected itself in increased plantings.

12. The development of the canning and concentrating industries to the high efficiency which they maintain today has helped to stabilize the industry, by creating new and broader markets than could have ever been reached by fresh fruit shipments.

13. The promulgation of laws, rules and regulations by the State Legislature and other legally constituted authorities has made for the satisfactory handling of the many questions having to do with handling and marketing a satisfactory crop.

14. The establishment of the system of experiment stations and extension services has aided the grower in the answer of many of the problems which are bound to arise in greater and still greater numbers with the cultivation of a predominant crop in a restricted area.

Such a list could be extended until I have used up all of my allotted time; no doubt I would have succeeded thoroughly in boring you with details. Allow me to say, the association of Florida has been strengthened by every one of the thinking growers of today, as well as those who have gone before.

But history is in the making with the advent of the CITRUS BUDWOOD CERTIFICATION PROGRAM now being developed through the wise judgment of the growers with the assistance of their duly authorized agents. One would be in error to say that this program is entirely of a voluntarily nature, for are not you, the grower, forced into it by systemic diseases with such interesting names as psorosis and xyloporosis which have been regularly taking their toll of your efforts before you have been able to take your profits? In such a program the varieties you will plant will be as free as science can today assure of those diseases which are transmittable through the usual propagational methods. Let us say that FEAR dictated this program;

NACO 'S experienced field representatives are ready to serve you.
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but that FEAR ALLAYED is progress.

Now let me take exception to some of the history of the association of Florida and citrus, and through this discussion point a way in which you, the grower, can make the program of high consequence to the future.

The principal commercial fruits of the citrus group in Florida are the sweet oranges, the grapefruit, the tangerines and the limes. Certain indications seem to point to possibilities for the lemons. Now, none of these fruits are grown simply as botanical species for the very nature of the species is its variability. One is interested in the variety, that is, a group of plants within a species which exihibits special characters and which has originated from a single plant or part of a plant and which is maintained true to type by vegetative propagation such as budding.

Yet with all of this understanding of a variety and the value of a variety from the standpoint of the grower, the processor, the shipper, the retailer, and the consumer our history points to the fact that, on the average, too little attention has been given to variety selection and to the safeguarding of the integrity of the variety. Witness the multitude of varieties which are in existence and are being grown to some degree of commercial importance in Florida.

Let us go a step further, into the realm of the horticultural strain of a variety. One might walk into any grove of Valencia oranges, for example, and examine the tree to tree conditions of yield and fruit qualities. It is an exceptional grove of any size of Valencias in which marked variations from tree to tree in these characters could not be shown. Such of these variations not induced by environmental conditions are due to the genetic composition of the tree itself and constitute the various strains of the Valencia variety.

A horticultural strain of a variety is defined as a group of plants within a variety which portrays the general characters of the variety while showing certain degree differences in these characters, which has originated from a single plant or part of a plant, and which is maintained true to type by vegetative propagation. The strain which we would wish to grow should show in the highest degree possible those characters for which the variety is known and valued.

Those who have worked with strains of varieties have often come to the conclusion that there must be but one "normal strain" of each variety, that which shows to the highest degree all of those characters for which the variety is noted. Certainly those Valencias which produce "corrugated fruit" are not of a desirable strain and should not be continued in propagation. Many of these trees would return better dividends were they top-worked to a strain not displaying corrugated fruits.

How many named varieties of sweet orange are grown in Florida? Compiled lists have shown over 50 varieties of such prominence as to be generally known, to which must be added many others which are locally grown or which have never been designated by name. For many years discussions have centered about the possibility of standardization of variety in the state for no such long list of varieties is required to fulfill our market requirements . . . or stated in another way, certain of these varieties must be better suited to our soil, climatic, cultural and market conditions than others of even the same season of maturity.

How many trees are today masquerading under a misnomer? Are all Pineapple oranges Pineapple oranges? How true have we kept our varieties by guarding our propagational lines?

Were I to wish to propagate Valencia, should I obtain the budwood from the first Valencia available? Should I not, rather, obtain the budwood from certain trees which over a period of years have not alone shown their freedom from disease but have also shown the possibilities of high yields of desirable type of fruits?

Just as the history of the citrus industry of Florida is a chronicle of the energies and thinking of the far-sighted growers of the past; the history of the present remains the development based on clear-thinking and good judgment of the current citrus growers. Let it be recorded that, while the scourges of psorosis and xylorosis were eliminated from the citrus being grown, the grower and nurseryman gave equal attention to the "trueness to type" for which the variety was noted.

USDA SENDS SPECIALISTS TO EUROPE TO PROMOTE SALES OF CITRUS FRUITS

The U. S. Department of Agriculture, in continuation of its program of expanding foreign markets and trade opportunities for United States citrus fruits and citrus products, is sending a marketing specialist to the citrus markets of Europe.

The specialist, J. Henry Burke of the Foreign Agricultural Service, will represent the Department in the citrus markets of the United Kingdom, France, Belgium, The Netherlands, Western Germany, Switzerland, Norway, Sweden and Denmark. Market opportunities for fresh citrus fruit will be investigated as well as outlets for American citrus products which are finding an increasingly important market in Western Europe.

As a part of his work, Mr. Burke also will visit the citrus producing areas in Spain and Italy to bring information on oranges and lemons in these increasingly important competitive areas up to date.

Reports on foreign citrus markets and foreign citrus producing areas competing with United States fruit are available from the Foreign Agricultural Service of the U. S. Department of Agriculture in Washington, D. C. in room 5922S — Telephone Republic 7-4142, Extension 2445.

Aluminum utensils are pitted by strong salt solutions of moist food left standing. A preventive measure is to empty pans immediately after using them.

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Reports Of Our Field Men . . .

HIGHLANDS AND POLK COUNTIES

J. T. Griffiths and J. K. Enzor, Jr.

The latter part of July and the first two weeks of August has found most growers coming back after their oil or parathion scalicide with sulfur sprays or dusts to control rust mites. The rust mite population seems to be falling at this time, but many groves still have very high populations and where this condition is found, sulfur should be applied to prevent "greasy melanose" this fall and winter. Most growers in this area are in the process of applying dolomite or hi-calcium limestone. The merits of this practice can not be over emphasized.

It looks as though fruit maturity is going to be very early this season and it is quite possible that some grapefruit will be shipped in early September. Grapefruit is sizing very well and appears to be maturing rapidly.

Moisture conditions have been very good over the past three weeks and many groves at this time are putting on another flush of growth. It looks as though considerable June bloom has set in many groves. Growers in this area are very optimistic about the marketing conditions for the coming season and it should be a good year for all concerned.

WEST CENTRAL FLORIDA

J. E. Mickler

Clouds still continue to gather and pour forth. Continued rain has groves and pastures in a lush state at present. The main concern is that splitting of fruit will occur with much more moisture.

Rust mites have plagued some growers to the extent of further dusting, and it would be best to keep a weather eye for more attacks. Prices indicated for fruit this coming season will warrant every precautionary measure to insure the best in a crop of fruit. In the same measure it behooves those growers that have not done so to examine the fertilizer program now employed and give serious consideration to the best that money can employ in a Lyonizing Program that consistently gives more and better fruit per acre and institute the best in programs for top dollars that are to come.

Those cattlemen that wonder about prices can also improve upon that feature with a sound and economical fertilizer program for pastures that produce better beef for less money.

PASCO AND HILLSBOROUGH COUNTIES

E. A. McCartney

We have had good growing weather with plenty of moisture in this section for the last three weeks.

Citrus is sizing up nicely and conditions look favorable for the new crop. Groves are in good condition and spray rigs are working every day—weather permitting.

Pastures are now at their best where they have been fertilized. This is the in-between time in the fertilizer business, checking groves and catching up on work that can be done at this time. It is also the vacation period so there is really nothing more to write about.

I want to call your attention to the groves that are being fertilized with Lyons Fertilizer—they stand out.

SOUTHWEST FLORIDA

Eaves Allison

First seedlings of peppers and tomatoes are in the ground now, Aug. 15th, and bulb growers are getting ready for their first early plantings also so grab your hats, boys, here we go again.

Rainfall in this area has been just barely sufficient lately—with an apparent surplus over the pasture lands between the Myakka River and Murdock.

I have been watching the amazing comeback in sixty days of a hundred acre grove that had been suffering from severe metals toxicity. This grove is on sour, Cleo and grapefruit root and consists of both early and late oranges and Marsh and common grapefruit of various ages—mostly pretty old. These trees had an overall dose of ten pounds each of 8-0-8 top dresser with ½ pound of chelated iron (Ferrogrene brand) added per tree. Applied in June there is now no signs of the toxicity anywhere in the grove.

Citrus prospects in this area for the coming season look very favorable.

NORTH HILLSBOROUGH AND PINELLAS COUNTIES

J. A. Hoffman

Heavy rainfall throughout this section during the past month has brought the water level higher than it has been for several years. Some growers are busy opening and cleaning drainage canals to drain water from low places.

Better than average cover crop is reported in most groves and trees are putting on an extra heavy growth with fruit sizing nicely. Navals and Hamlins are expected to be on the market early this year. Buyers are quite active in this section on Hamlins and growers are looking for a good year.

Lime growers in this section are reporting profitable returns.

Groves should be carefully checked for rust mite and sulphur sprays applied where they appear.

SOUTH POLK, HIGHLANDS, HARDEE AND DESOTO COUNTIES

C. R. Wingfield

For the past 60 days there has been a constant fight for control of scales and rust mite. Mid-August finds scale infestations at a low ebb while rust mite, although on the decrease, is still above the desired level, both on the fruit and leaves. The rains have possibly been a factor in the mite control in that it has delayed the spraying.

In some areas the rains have been, not only daily but heavy and it has been necessary to plow water furrows in the groves for drainage. Yet in some sections the rainfall has not been more than is actually needed. The groves are looking good and fruit is showing up some better than first thought, but mid-season fruit certainly is far short of a normal crop.

The buyers are beginning to show interest in crops and some fruit is being bought.

Vegetable growers have been delayed in land preparation due to rains in most of the farming areas

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Uncle Bill Says:

We can remember way back when we figgered that an orange or two was mighty fine, but the only time they could get hold of 'em was at Christmas time when they made fine presents for everybody in the family.

Then some years later we can remember seein' huge piles of citrus which had been culled out of the packin' houses and stacked up in the rear of the buildings, where after so long a time they bred the biggest crops of flies and bugs you ever saw.

This didn't last long 'cause the grower figgered that if he raised better fruit there wouldn't be any cull piles . . . and that's where good fertilizin' and better cultural practices really did a job for the growers.

Then along about this time competition from other citrus growin' areas made marketin' sort of tough, for they wasn't enough folks buyin' fresh fruit to use up the supply, so we began to experiment with canned juice and grapefruit and orange sections, which we managed after a while to make so palatable that there was a big market for 'em.

But that wasn't enough, so just a very few years ago we started puttin' up citrus concentrate and with each passing year the demand for this year 'round drink has been growin' bigger and bigger, until now the demand is nationwide at all seasons of the year.

Note here lately where they're plannin' to develop a citrus powder which when mixed with water will provide the full measure of goodness of the citrus from which it was made.

All of which is a mighty strong indication of the sort of ingenuity that goes to make up the folks who grow and market our citrus crops . . . and leads us to the conclusion that we're still a long, long way from producin' too much citrus.

And we ain't even mentioned the by-products of citrus which goes into the manufacture of cattle feed and the like . . . they say meat packers use everything in the pig "but the squeal" and it looks like us citrus folks is in about the same class.

THE CITRUS BUDWOOD CERTIFICATION PROGRAM

(Continued from page 9)

tive registered parent tree has passed the preliminary inspection. Scion grove trees shall not be eligible for registration until the prospective parent tree has been registered as to apparent freedom from psorosis and xyloporosis and all other requirements specified under Registration of Scion Grove Trees are met.

Provisions are further made for careful supervision of the taking of all buds and the handling of all certified trees in a manner that would insure that growers receive trees free from the bud-transmissible diseases and many other handicaps of the past. I will not attempt to go into a detailed discussion of all phases of the requirements, inspections and policies connected with the program, as all of this can be obtained in great detail from the Citrus Budwood Certification office at Winter Haven, Florida, but I do want to give you a short progress report on the work that has been done by the State Plant Board to develop this program which you as citrus growers have worked so long and hard to establish.

Twenty-one growers and nurserymen are already in the program, with 375 trees that have passed all preliminary tests and inspections. They represent eleven of the leading citrus counties in the State. Trees in the program represent the following varieties: **Oranges** — Valencia, Pineapple, Hamlin, Pope, Summer, Parson Brown, Lou Gim Gong, Navel, Mediterranean Sweet, Jaffa, Seedling; **Grapefruit** — Marsh Seedless, Thompson Pink, Marsh Pink, Miscellaneous Red, Duncan, Foster Pink, McCarty; **Miscellaneous** — Temple, Dancy Tangerine, Orlando Tangelo, Satsuma, Lake Tangelo, Murcott, Minneola Tangelo, Calamondin, Limequat.

Additional growers and nurserymen are coming into the program as rapidly as they can be properly processed and serviced.

The State Plant Board is making every effort to develop out of this program just what you growers want and need. In the future you should be able to develop or buy citrus-budwood certified trees with assurance that they are not infected with hidden diseases that will soon impair their bearing capacity or cut their life abnormally short. We are told by citrus plant pathologists that in some instances as much as 90% of the trees in some groves are infected with psorosis, and that these trees become shy bearers and often die at the age when they should reach full production. Every weak, shy-bearing tree and every vacancy in a grove is a grower's liability or handicap at producing a living or a profit from his grove property.

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TIME OF GRADING FRUITS CAN BE CUT 15 TO 75 PERCENT

The labor required to sort and grade fruits and vegetables for visual defects by the usual method can be reduced substantially by changing to methods tested in a research project by the University of California and the U. S. Department of Agriculture. The tests indicated that the man hours for sorting and grading lemons can be reduced by about 75 percent, for oranges 67 percent, and for potatoes 15 percent. Studies in some fruit packing plants indicate that sorting and grading account for roughly 15 percent of the total labor costs.

The improvements are based largely on methods and equipment which assure that the fruit or vegetable on the grading belt passes the sorter at the proper speed, at the correct speed of rotation and with the proper number of rows of the commodity on the belt.

With four rows of lemons on the belt, it was found that the most efficient sorting resulted when the specimens revolved three times per foot of forward movement. Direct approach of the fruit toward the sorter was found to be more efficient than movement of the fruit past a sorter standing beside the belt. With oranges, the best speed of rotation was 1.53 revolutions per foot of forward movement. For potatoes, the best result was obtained with three rows rotating three times per foot of forward movement.

In the experiments, wooden specimens were used, shaped and painted to resemble oranges, lemons, and potatoes, with spots representing defects of various sizes painted on the surfaces. This was necessary because real produce would have been injured more and more by repeated handling and grading, and accurate comparisons of efficiency in sorting and grading would have been impossible. Tests were made later in packing houses to check the accuracy of findings with wooden specimens.

The experiments and tests were conducted by the University's Institute of Engineering Research under contract with the U. S. Department of Agriculture. The contract was administered by the Marketing and Facilities Research Branch of the Production and Marketing Administration, under authority of the Agricultural Marketing Act of 1946.

Other factors affecting the speed and accuracy of sorting and grading also are discussed in a report on the study, "Visual Inspection of Products for Surface Characteristics in Grading Operations." A copy of the report may be obtained from the Office of Information Services, PMA, U. S. Department of Agriculture, Washington 25, D. C.

Burn or bury empty insecticide containers.

Falls are the principal type of injury occurring on the farm and the home.

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SUPERIOR CITRUS TREES—Now available on Rough Lemon, Sour Orange, Sweet Orange, and Cleo Rootstocks. Prices $1.10 up, depending on the size and number ordered. Also Seedlings for lining out of all varieties. Write for "Tips to Growers".
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Locker Plants Important In Merchandising Frozen Food

Frozen food locker plants are becoming important sources of commercial frozen food for their locker patrons, home freezer owners, and others—including stores, institutions, and restaurants—according to a study of 1,350 plants scattered throughout the country made by the Farm Credit Administration of the U. S. Department of Agriculture.

About two-thirds of the locker plants surveyed were selling frozen foods. The percentage was highest in the North Atlantic States, averaging 82 percent, and lowest in the South Central Section where it averaged only 54 percent. Although many locker plants sell frozen foods, the sales volume per plant is small, about $8,400 in 1952, with 4 percent of the plants having sales of more than $50,000. Seventy-two percent of all commercial frozen food is sold at retail to locker patrons, home freezer owners and other consumers. Twenty-eight percent is sold to stores, institutions, restaurants and others.

Despite notable advances in production, processing and storage, says the report, the future expansion of the frozen food industry is seriously handicapped by its distribution system. It is only natural that locker plants, many of them with unused storage and freezing capacity, and at some distance from large distributing centers, should often become distributing points for commercial frozen foods.

To expand their sales, the report points out most locker plants need to strengthen their purchasing power through such methods as pooling orders with other plants. Also, they need to promote the sales of frozen food in quantity lots to home freezer and locker patrons. This may involve some form of financing for quantity purchases. The study made under the Agricultural Marketing Act of 1946, is reported in FCA Miscellaneous Report 175, "Merchandising Commercial Frozen Food by Locker Plants, 1952." A copy of the report may be obtained from the Farm Credit Administration, U. S. Department of Agriculture, Washington 25, D. C.

CALIF.-ARIZ. MARKETING PROGRAM TO BE AMENDED

The U. S. Department of Agriculture announced its decision, subject to industry acceptance, to amend the marketing agreement and order regulating the handling of lemons grown in California and Arizona. The decision is based upon evidence received at a public hearing held on May 1 at Los Angeles. The amendment would include in District 3 parts of San Bernardino and Riverside counties in California which are adjacent to California-Arizona line.

The amendment will be made effective if two-thirds of the growers by volume of production during the 1951-52 season or three-fourths of the growers by number approve it, and if handlers of not less than 80 percent of the lemons shipped in fresh fruit channels sign the amended marketing agreement.

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